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PTO/SB/21 (08-00)

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**TRANSMITTAL
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(to be used for all correspondence after initial filing)

Application Number

09/369,134

Filing Date

August 5, 1999

First Named Inventor

Tarlton

Group Art Unit

3676

Examiner Name

V. Patel

Total Number of Pages in This Submission

74

Attorney Docket Number

11666.0102.NPUS00

ENCLOSURES (check all that apply)

Fee Transmittal Form



Fee Attached



Amendment / Reply



After Final



Affidavits/declaration(s)



Extension of Time Request



Express Abandonment Request



Information Disclosure Statement



Certified Copy of Priority Document(s)

Response to Missing Parts/
Incomplete ApplicationResponse to Missing Parts
under 37 CFR 1.52 or 1.53Assignment Papers
(for an Application)

Drawing(s)



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After Allowance Communication
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(Appeal Notice, Brief, Reply Brief)

Proprietary Information



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or
Individual nameRichard C. Auchterlonie; Howrey Simon Arnold & White, LLP
Reg. No. 30, 607

Signature

Richard C. Auchterlonie

Date

January 13, 2003

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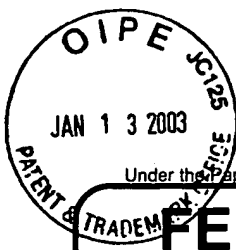
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PTO/SB/17 (01-03)

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FEE TRANSMITTAL for FY 2003

Effective 01/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT

(\$)

Complete if Known

Application Number	09/369,134
Filing Date	08/05/1999
First Named Inventor	Oran D. Tarlton
Examiner Name	V. Patel
Art Unit	3676
Attorney Docket No.	11666.0102.NPUS00

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None☒ Deposit Account:Deposit Account Number
Deposit Account Name

01-2508

Howrey Simon Arnold & White

The Commissioner is authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Credit any overpayments☒ Charge any additional fee(s) during the pendency of this application☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1001 750	2001 375	Utility filing fee	
1002 330	2002 165	Design filing fee	
1003 520	2003 260	Plant filing fee	
1004 750	2004 375	Reissue filing fee	
1005 160	2005 80	Provisional filing fee	

SUBTOTAL (1) (\$)

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims	Extra Claims	Fee from below	Fee Paid
Independent	-20** =	X	
Multiple Dependent	-3** =	X	

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description
1202 18	2202 9	Claims in excess of 20
1201 84	2201 42	Independent claims in excess of 3
1203 280	2203 140	Multiple dependent claim, if not paid
1204 84	2204 42	** Reissue independent claims over original patent
1205 18	2205 9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$)

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Small Entity

Fee Code (\$)	Fee Code (\$)	Fee Description	Fee Paid
1051 130	2051 65	Surcharge - late filing fee or oath	
1052 50	2052 25	Surcharge - late provisional filing fee or cover sheet	
1053 130	1053 130	Non-English specification	
1812 2,520	1812 2,520	For filing a request for <i>ex parte</i> reexamination	
1804 920*	1804 920*	Requesting publication of SIR prior to Examiner action	
1805 1,840*	1805 1,840*	Requesting publication of SIR after Examiner action	
1251 110	2251 55	Extension for reply within first month	
1252 410	2252 205	Extension for reply within second month	
1253 930	2253 465	Extension for reply within third month	
1254 1,450	2254 725	Extension for reply within fourth month	
1255 1,970	2255 985	Extension for reply within fifth month	
1401 320	2401 160	Notice of Appeal	
1402 320	2402 160	Filing a brief in support of an appeal	
1403 280	2403 140	Request for oral hearing	
1451 1,510	1451 1,510	Petition to institute a public use proceeding	
1452 110	2452 55	Petition to revive - unavoidable	
1453 1,300	2453 650	Petition to revive - unintentional	
1501 1,300	2501 650	Utility issue fee (or reissue)	
1502 470	2502 235	Design issue fee	
1503 630	2503 315	Plant issue fee	
1460 130	1460 130	Petitions to the Commissioner	
1807 50	1807 50	Processing fee under 37 CFR 1.17(q)	
1806 180	1806 180	Submission of Information Disclosure Stmt	
8021 40	8021 40	Recording each patent assignment per property (times number of properties)	
1809 750	2809 375	Filing a submission after final rejection (37 CFR 1.129(a))	
1810 750	2810 375	For each additional invention to be examined (37 CFR 1.129(b))	
1801 750	2801 375	Request for Continued Examination (RCE)	
1802 900	1802 900	Request for expedited examination of a design application	

Other fee (specify)

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SUBTOTAL (3) (\$)

SUBMITTED BY

Name (Print/Type)	Richard C. Auchterlonie	Registration No. (Attorney/Agent)	30,607	Telephone	713-787-1698
Signature	<i>Richard C. Auchterlonie</i>	Date	13 Jan. 2003		

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Where Application of:
Oran D. Tarlton

Serial No.: 09/369,134

Filed: August 5, 1999

For: COMPOSITE METAL-TO-METAL SEAL
HAVING A RELATIVELY SOFT METAL
OVERLAY AND A RELATIVELY HARD
METAL CORE

Group Art Unit: 3676

Examiner: V. Patel

Atty. Dkt. No.: 11666.0102.NPUS00

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APPELLANT'S BRIEF PER 37 C.F.R. § 1.192

GROUP 3600

Commissioner for Patents
Washington, D.C. 20231

Sir:

This appeal brief, filed in triplicate, is in support of Appellant's appeal filed on November 14, 2002. In the subject application, a fee was paid for an appeal brief filed on October 9, 2001. The Examiner reopened prosecution in an Official Action dated December 5, 2001. Pursuant to M.P.E.P. Sec. 1208.03 (August 2001, page 1200-26), appellant understands that the fee paid for the appeal brief filed on October 9, 2001 will be applied to this later filed appeal in this same application. Therefore no additional appeal fee should be required. In case this procedure has changed, please deduct any required fee from Howrey Simon Arnold & White, LLP., Deposit Account No. 01-2508, order No. 11666.0102.NPUS00. Enclosed is a Fee Transmittal Form authorizing any fee required under 37 C.F.R. 1.16 and 1.17 to be deducted from this Deposit Account No. 01-2508.

I. Real Party in Interest

The real party in interest is Oil States Industries, Incorporated, by virtue of an assignment from the inventor recorded at Reel 010155, Frame 0504.

II. Related Appeals and Interferences.

A first appeal in this application was filed on July 27, 2001. Applicants filed an Appeal Brief on October 9, 2001. The Examiner reopened prosecution in an Official Action dated December 5, 2001. There are no other related appeals or interferences.

III. Status of the Claims.

Claims 1 to 26 have been presented for examination.

Claims 15 to 20 have been withdrawn from consideration and have been cancelled.

Claims 1, 2, 8, and 9, have been cancelled.

Claims 3 to 7, 10 to 14, and 21 to 26 stand finally rejected, and are being appealed.

IV. Status of Amendments.

No amendment was filed in response to the Final Official action dated May 16, 2002.

V. Summary of Invention.

The invention relates generally to a pressure seal for containing fluid pressure at an annular interface having a metal-to-metal contact with one or more metal annular members. (Specification, page 2, lines 8 to 11.) In particular, it is desired to make a proper metal-to-metal seal in a pipe connector of the kind that forms a pressure seal by wedging a metal seal ring

between two hubs, and to permit the metal-to-metal seal to be broken and later properly reset. (Specification, page 2, lines 17 to 20 and page 3, lines 6 to 10.)

To solve these problems, there is provided a composite metal seal (15) that includes a core (34) of relatively hard metal, and at least one annular region (35, 36) of relatively soft metal. The annular region of relatively soft metal is integrally bonded with the core of relatively hard metal, and has an annular sealing surface (32, 33) for providing a fluid pressure seal. (Specification, page 4, lines 19 to 24; page 13 line 23 to page 14 line 10; FIG. 3.) In particular, the annular region of relatively soft metal 35, 36 is welded onto the relatively hard metal core 34. (Specification, page 17, lines 8 to 16; FIG. 6.)

The composite metal seal (15) is shown in FIG. 3, as reproduced below. In an alternative embodiment, shown in FIG. 4 reproduced below, the annular regions 35' 36' of relatively soft metal have respective annular grooves 37, 38 in the annular sealing surfaces 32', 33'. These annular grooves 37, 38 are intended to receive elastomeric O-rings to be used with the seal for sealing hub surfaces which have been slightly damaged. (Appellant's specification, page 7, lines 5 to 8; page 16 line 9 to page 17 line 7.)

The appellant's invention provides a number of advantages. The composite metal seal ring 15 functions as an integral piece of metal, although the properties of the metal are different in different regions of the composite metal seal ring. (Specification, page 17, lines 13 to 16.) The soft overlay metal can flow into any discontinuity that may exist in the hub seal surfaces and effect a seal. Moreover, the soft overlay metal will not scratch or impinge the hub sealing surfaces. (Specification, page 14, lines 7 to 10.) The hard metal core 34 ensures that there can be a relatively high contact stress between the metal seal ring 15 and the hub sealing surfaces. The high compressive stress in the seal enhances the seal's ability to withstand any external

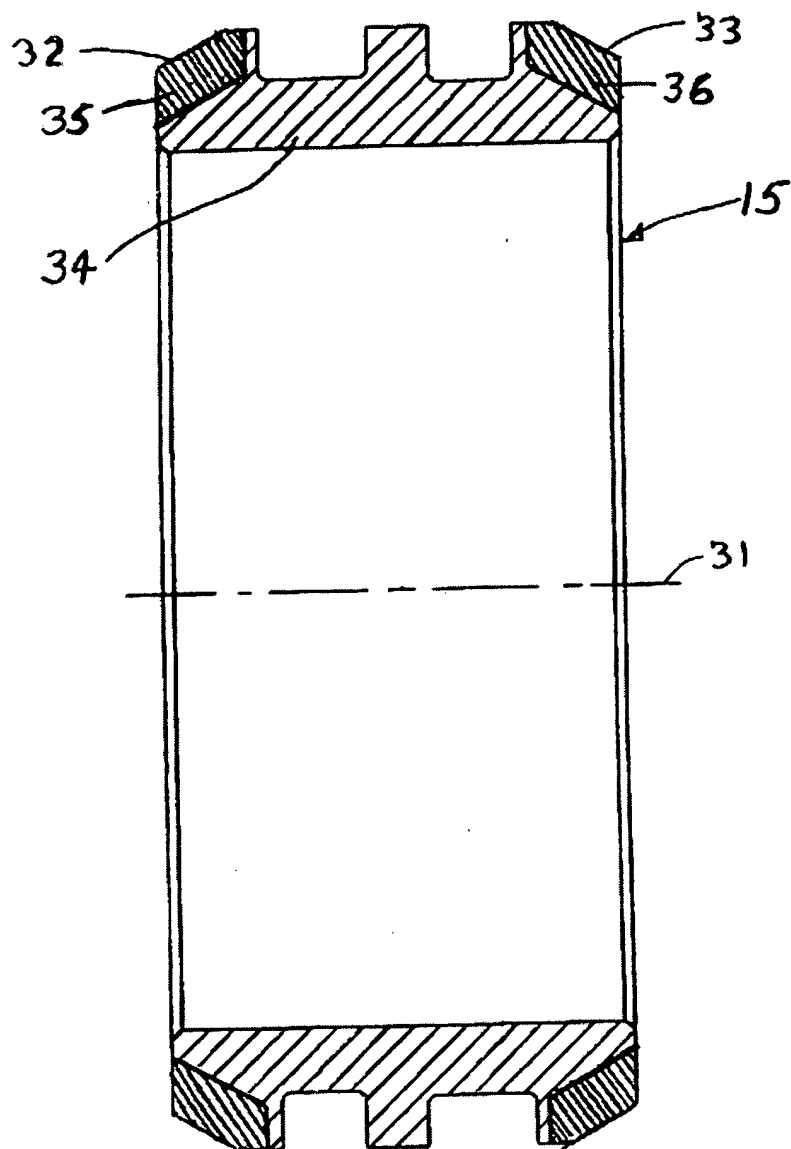


FIG. 3

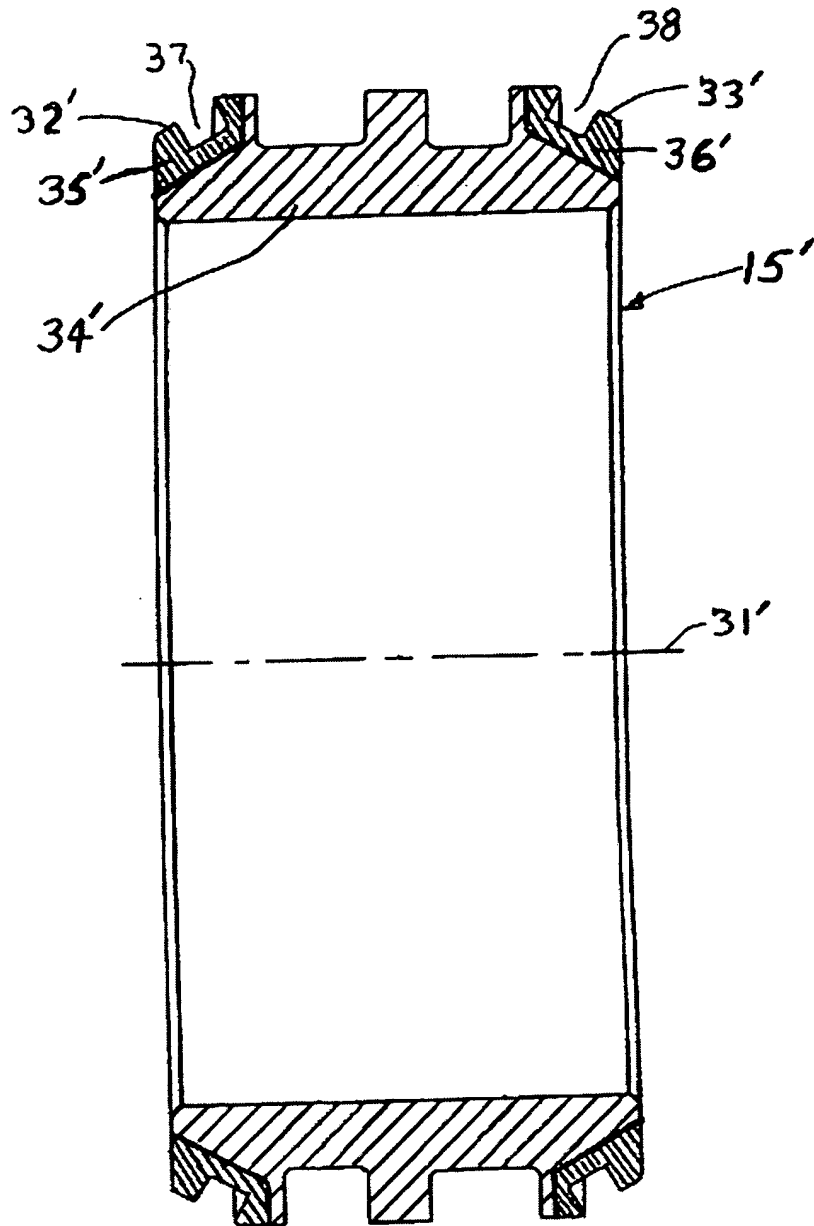


FIG. 4

pressure, and internal pressure further energizes the seal. By overlaying a high strength core, the high strength capacity of the seal is maintained and a softer exterior surface is presented that will deform prior to deformation of the hub surfaces. Therefore, the hard metal core 34 ensures that the seal ring can be used after making and breaking the metal seal numerous times.

(Specification, page 14, lines 11 to 21.)

VI. Issues.

1. Whether claims 3-4, 6, 10-11, and 13 are unpatentable under 35 U.S.C. 103(a) over Fyffe (U.S. 1,426,724) in view of Ogino et al. (U.S. 5,651,494).

2. Whether claims 21 and 25 are unpatentable under 35 U.S.C. 103(a) over Fyffe and Ogino.

3. Whether claims 5, 7, 12 and 14 are unpatentable under 35 U.S.C. 103(a) over Fyffe and Ogino and further in view of Poe (U.S. 4,563,025).

4. Whether claim 22 is unpatentable under 35 U.S.C. 103(a) over Fyffe and Ogino and further in view of Poe.

5. Whether claims 23, 24 and 26 are unpatentable under 35 U.S.C. 103(a) over Fyffe, Ogino and Poe.

VII. Grouping of Claims.

GROUP 1. Claims 3-4, 6, 10-11, and 13.

GROUP 2. Claims 21 and 25.

GROUP 3. Claims 5, 7, 12 and 14.

GROUP 4. Claim 22.

GROUP 5. Claims 23, 24 and 26.

Appellant states that the claims in GROUP 5 do not stand or fall together, and consider that the following sub-groups 5A and 5B are each separately patentable:

Sub-Group 5A. Claims 23 and 24.

Sub-Group 5B. Claim 26.

VIII. Argument.

The policy of the Patent and Trademark Office has been to follow in each and every case the standard of patentability enunciated by the Supreme Court in Graham v. John Deere Co., 148 U.S.P.Q. 459 (1966). M.P.E.P. § 2141. As stated by the Supreme Court:

Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.

148 U.S.P.Q. at 467.

The problem that the inventor is trying to solve must be considered in determining whether or not the invention would have been obvious. The invention as a whole embraces the structure, properties and problems it solves. In re Wright, 848 F.2d 1216, 1219, 6 U.S.P.Q.2d 1959, 1961 (Fed. Cir. 1988).

1. Claims 3-4, 6, 10-11, and 13 are not unpatentable under 35 U.S.C. 103(a) over Fyffe (U.S. 1,426,724) in view of Ogino et al. (U.S. 5,651,494).

Fyffe U.S. Patent 1,426,724 issued August 22, 1922, discloses an assembly for joining two hard metal pipes. The assembly comprises a pair of collars each flared or swelled at one end, means for securing the collars to the pipes to be joined, a hollow hard metal core adapted to lie in the swelled ends of the collars, a seating of soft metal adapted to lie between the collars and the core, and means for drawing the collars towards one another so as to grip the seating between the collars and core. The core is provided with a central rib, and the internal surface of the collars and the external surface of the core being spherical in form. (Fyffe, lines 69-81.) In an alternative assembly (Fig. 3), the surface of the core and corresponding swelled surfaces of the collars are conical. (Lines 53-62.)

Ogino et al. U.S. Patent 5,651,494 discloses a method of ultrasonic welding of different metals. A stack of two different metals to be welded, one of which is harder than the other, and an additional soft metal placed on the harder metal is placed between a pair of horn tips (grip members) of an ultrasonic welder. The harder metal is covered with a soft metal layer of a high plastic fluidity. Serrations are formed on the surface of the horn tips to grip the softer metal and the additional metal tightly when ultrasonic vibration is applied. (Ogino, Abstract.)

The Final Official Action, on page 4, recognizes that “Fyffe fails to disclose that the hard and soft metals are integrally bonded together.” The Final Official Action, on page 4, says that “Ogino discloses integrally bonding of hard metal to soft metal by welding.” The Final Official Action, on page 4, concludes: “It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the hard metal and soft metal of Fyffe to be welded as

taught by Ogino to provide a bond between metals and also not to loss the soft metal from the hard metal (col. 1, lines 41-43).” The appellant respectfully disagrees.

Fyffe and Ogino are in such diverse fields and deal with such diverse problems that one working in the pressure seal art would not be motivated to look to ultrasonic welding art. In this particular case, recognition that there was a problem to be solved was part of the appellant’s invention. Even if one were to recognize the particular problem to which the appellant’s invention pertains, there is no basis for concluding that Ogino would have been considered by one skilled in the pipe seal art working on that problem.

For the teachings of a reference to be prior art under 35 U.S.C. §103, there must be some basis for concluding that the reference would have been considered by one skilled in the particular art working on the particular problem with which the invention pertains. In re Horne, 203 U.S.P.Q. 969, 971 (C.C.P.A. 1979). Non-analogous art cannot properly be pertinent prior art under 35 U.S.C. §103. In re Pagliaro, 210 U.S.P.Q. 888, 892 (C.C.P.A. 1981). As explained in In re Clay, 966 F.2d 656, 659, 23 U.S.P.Q.2d 1058, 1060-61 (Fed. Cir. 1992):

Two criteria have evolved for determining whether prior art is analogous: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor’s endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor attempts to solve...

A reference is reasonably pertinent if, even though it may be in a different field from the inventor’s endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor’s attention in considering his problem. Thus, the purposes of both the invention and the prior art are important in determining whether the reference is reasonably pertinent to the problem the invention attempts to solve.

In the present case, Ogino is in the ultrasonic welding art, which is not in the inventor's field of endeavor, which is the pipe joining and sealing art. Nor is Ogino reasonably pertinent to the particular problem with which the inventor was involved. The inventor was involved in making a better seal at a pipe joint that could be coupled and uncoupled. A desire to make a better seal at a pipe joint that could be coupled and uncoupled would not lead one to look at the ultrasonic welding art. Nor would the purpose of Ogino provide any suggestion that Ogino is reasonably pertinent to a desire to make a better seal at a pipe joint that could be coupled and uncoupled. Ogino's purpose is to improve the bond strength of ultrasonic welding of different metals having such different hardness such as steel and aluminum that ultrasonic vibration cannot be transmitted easily to the soft metal. (Ogino, col. 1, lines 14-16 and 27-30.) Prior to the appellant's invention, the improvement of bond strength of ultrasonic welding had no pertinence to making a better seal at a pipe joint that could be coupled and uncoupled.

Even if Ogino were considered to be analogous art, a rejection under 35 U.S.C. 103 cannot be based on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale supporting the rejection. Common knowledge and common sense of a person of ordinary skill is insufficient. In re Lee, 277 F.3d 1338, 1343, 61 U.S.P.Q.2d 1430, 1435 (Fed. Cir. 2002). "[T]here must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the appellant." In re Dance, 160 F.3d 1339, 1343, 48 U.S.P.Q.2d 1635, 1637 (Fed. Cir. 1998). "[T]eachings of references can be combined only if there is some suggestion or incentive to do so." In re Fine, 837 F.2d 1071, 1075, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988) (Emphasis in original) (quoting ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984)). "[P]articular findings must be made as to the reason the skilled artisan, with no

knowledge of the claimed invention, would have selected these components for combination in the manner claimed.” In re Kotzab, 217 F.3d 1365, 1371, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000). See, for example, Fromson v. Advance Offset Plate, Inc., 755 F.2d 1549, 1556, 225 U.S.P.Q. 26, 31 (Fed. Cir. 1985) (nothing of record plainly indicated that it would have been obvious to combine previously separate lithography steps into one process); In re Gordon et al., 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) (mere fact that prior art could be modified by turning apparatus upside down does not make modification obvious unless prior art suggests desirability of modification); Ex Parte Kaiser, 194 U.S.P.Q. 47, 48 (PTO Bd. of Appeals 1975) (Examiner's failure to indicate anywhere in the record his reason for finding alteration of reference to be obvious militates against rejection).

In the present application, there is nothing in the prior art of record to suggest the desirability of welding the soft metal to the hard metal in the seal of Fyffe. Fyffe appears to be entirely satisfactory for its intended purpose of making a metal-to-metal fluid pressure seal between two hubs. Moreover, there is nothing in Ogino suggesting that his ultrasonic welding should be used for fabricating a pressure seal. Furthermore, it appears that Ogino's apparatus of FIG. 2 would need to be modified somehow for welding of the hard and soft metal in the seal of Fyffe, due to the fact that Ogino's ultrasonic welding method drives the hard metal into the soft metal, as shown in FIG. 3A and described in column 2 line 66 to column 3 line 4.

2. Claims 21 and 25 are not unpatentable under 35 U.S.C. 103(a) over Fyffe and Ogino.

The combination of Fyffe and Ogino has been distinguished above. In addition, the limitation of a thickness of 1/8 inch further distinguishes the combination of Fyffe with the other references showing thin films of soft or non-corrosive material, such as gold or silver plating, at a sealing interface. A thickness of 1/8 inch or more of relatively soft material functions in a substantially different way than a thin film, for example with respect to the stress relief and plastic flow described on page 15, line 15 to page 16, line 4 of appellant's specification. Claims 21 and 25 include additional limitations specifically directed to "effecting a resettable fluid pressure seal with respective annular surfaces of first and second hub members, ..." such as first and second annular regions of relatively soft metal, which are tapered in a particular way with respect to the longitudinal axis.

3. Claims 5, 7, 12 and 14 are not unpatentable under 35 U.S.C. 103(a) over Fyffe and Ogino and further in view of Poe (U.S. 4,563,025).

Poe U.S. Patent 4,563,025 discloses a conduit connector in which flange members on the conduits are provided with recesses mutually accommodating the insertion of a metallic sealing ring. The ring is provided with mutually spaced peripheral sealing lands on respective ones of its oppositely tapered sides. (Poe, Abstract).

The combination of Fyffe and Ogino has been distinguished above. There is nothing in Poe that makes up for the deficiency in Fyffe and Ogino, or would motivate one to modify Fyffe in view of Ogino. Moreover, each of the claims 5, 7, 12, and 14 define that an annular region of relatively soft metal has at least one annular groove in the neighborhood of the annular surface of the first annular region of relatively soft metal.

The Final Official Action, page 5, says: "Poe disclose grooves on top of a deformable seal ring and the grooves are rectangular in cross-section and having walls that are perpendicular to tapered annular surfaces of the deformable seal ring (figure 5)." However, Poe says (Abstract): "The ring is designed so that the recesses separating the lands will essentially maintain their integrity for all radial compressions to the ring which is intended for use solely within the elastic limit and below the yield point of the material of such ring." In other words, the sealing ring of Poe is directed to "the use of desirably hardened metal sealing rings made of stainless steel, for example, and cooperation with seats of softer metal or portions thereof might be deformed or scored." (Poe, col. 1, lines 36-39.) Therefore, Poe provides grooves in the sealing ring to provide multiple sealing lands, and "should a portion of the seat structure of the flange members become scored or damaged so as to prevent a complete sealing action to take effect as between such flange member and one of the sealing lands of the ring, the remaining lands will still be present to effect the sealing function. An equivalent advantage obtains where it is one of the lands that might have a marred surface; the remaining lands will effect the seal. The recesses between the sealing lands of the sealing ring are provided, additionally, in such sealing ring to distribute the stress pattern and also to enable the ring to remain within the elastic limit of the seal ring material." (Poe, Abstract.)

The Final Official Action, page 5, concludes: "It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the first and second annular region of relatively soft metal to have grooves as taught by Poe, to maintain the integrity of all radial compression to the ring and also to enable the ring to remain within the elastic limit of the seal ring material (Abstract of Poe, lines 15-31)." However, Poe is placing grooves in relatively hard material of the seal in comparison to relatively soft material of the seat structure of the

flange members. Therefore, the cited art does not provide proper motivation for putting grooves in the relatively soft metal regions of the appellant's seal. Placing grooves in the relatively soft regions of the appellant's seal would not tend to maintain the integrity of radial compression to the seal, since the grooves would tend to weaken the relatively soft regions of the appellant's seal. The appellant, for example, puts grooves in the relatively soft material of the seal "in order to permit elastomeric O-rings to be used with the seal for sealing hub surfaces which have been slightly damaged; ..." (Appellant's specification, page 7, lines 5 to 8; page 16 line 9 to page 17 line 7.) In contrast, Poe is attempting to solve the sealing problem in a way different from the appellant's invention, by grooving relatively hard material of a seal engaging relatively soft material of a seat structure of the flange members, instead of welding relatively soft material to relatively hard material of the seal.

4. Claim 22 is not unpatentable under 35 U.S.C. 103(a) over Fyffe and Ogino and further in view of Poe.

The combination of Fyffe, Ogino, and Poe has been distinguished above.

5. Claims 23, 24 and 26 are not unpatentable under 35 U.S.C. 103(a) over Fyffe, Ogino and Poe.

The combination of Fyffe, Ogino, and Poe has been distinguished above. Claim 23 is dependent upon claim 21, and further defines that the composite metal seal ring is adapted for containing a pressure within the hubs of at least 10,000 psi. Claim 24 is also dependent on claim

21, and further defines that the composite metal seal ring has an internal diameter of at least 3 inches. Therefore, claims 23 and 24 distinguish Fyffe, Ogino, and Poe for the same reasons given above with respect to claim 21.

Claim 26 is an independent claim to a composite metal seal ring for effecting a “resettable” fluid pressure seal. Claim 26 includes limitations similar to claim 21 and therefore is distinguished from Fyffe, Ogino, and Poe for the same reasons given above with respect to claim 21. In addition, claim 26 further defines that the composite metal seal ring is adapted for containing a pressure within the hubs of at least 10,000 psi, the composite metal seal ring has an internal diameter of at least 3 inches, and the composite metal seal ring is a hybrid of a pressure energized seal type AX and a compression seal type BX. In other words, the composite metal seal ring of claim 26 is especially adapted for solving the problem of making subsea pipe connections that can be set and reset a number of times during remote assembly and disassembly of high-pressure subsea pipelines. (Appellant’s specification, page 2 lines 14-20; page 10 line 20 to page 11 line 1; abstract, lines 14 to 17.) The high compressive stress in the seal (permitted by the relatively hard core of the seal) enhances the seal's ability to withstand any external pressure. (See appellant’s specification, page 14, lines 13-16.) This permits the seal to be used at relatively deep subsea locations, regardless of whether the subsea pipeline is pressurized. It is not seen how any proper combination of Fyffe, Ogino, and Poe would solve this problem, and certainly not in the same fashion as called for by appellant’s claim 26.

Conclusion.

The Final Official Action, page 6, includes a response to appellant's arguments. This response appears to suggest that the substantially different environment between Fyffe and each of the secondary references (Ogino and Poe) is of no consequence because the secondary references are used to teach only very specific things, such as welding between two different metals, or grooves are used for different things (maintaining integrity of radial compression to the ring and to enable the ring to remain within the elastic limit of the seal material). The response also refers to particular dimensions and pressures as just a matter of design choice. However, the patent law requires a determination as to whether the "subject matter as a whole would have been obvious ..." 35 U.S.C. 103(a) (emphasis added). As cited above, the pertinent case law construing 35 U.S.C. 103(a) does not permit one to discount the substantially different environment, construction, and purpose between Fyffe and each of the secondary references (Ogino and Poe) or rely on conclusory statements when dealing with particular combinations of prior art and specific claims.

In short, annular seals for coupling metal tubular members as in Fyffe, and various welding techniques, have been known for about 80 years since Fyffe, yet none of the art cited by the examiner applicable to annular seals suggests the appellant's invention, which admittedly offers significant advantages over the prior art. This is objective evidence of the patentability of the appellant's invention. Fromson v. Advance Offset Plate, Inc., 755 F.2d 1549, 1557, 225 U.S.P.Q. 26, 32-33 (Fed. Cir. 1985) (It is at best bizarre to assert that the subject matter claimed was merely an obvious extension of technology when none skilled in the art attempted such "extension" during the seven years when alleged economic advantages of such technology were available).

In view of the above, it is respectfully submitted that the final rejection of the appellant's claims should be reversed.

Respectfully submitted,



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APPENDIX I.

The claims involved in this appeal are as follows:

3. The composite metal seal as claimed in claim 4, wherein the core of relatively hard metal is inlaid and overlaid with the relatively soft metal of the annular region of relatively soft metal.

4. A composite metal seal comprising a core of relatively hard metal, and at least one annular region of relatively soft metal that is integrally bonded with the core of relatively hard metal and that provides an annular sealing surface for effecting a fluid pressure seal, wherein the annular region of relatively soft metal is welded onto the core of relatively hard metal.

5. The composite metal seal as claimed in claim 4, wherein the annular region of relatively soft metal has at least one annular groove in the neighborhood of the annular surface of the annular region of relatively soft metal.

6. The composite metal seal as claimed in claim 4, wherein the composite metal seal has a longitudinal axis, and the sealing surface is tapered with respect to the longitudinal axis.

7. The composite metal seal as claimed in claim 6, wherein the annular region of relatively soft metal has at least one annular groove in the neighborhood of the annular sealing

surface, the annular groove being rectangular in cross-section and having walls that are perpendicular to the tapered annular sealing surface.

10. The composite metal seal ring as claimed in claim 11, wherein the annular core of relatively hard metal is inlaid and overlaid with the relatively soft metal of the first annular region of relatively soft metal, and the annular core of relatively hard metal is inlaid and overlaid with the relatively soft metal of the second annular region of relatively soft metal.

11. A composite metal seal ring for effecting a fluid pressure seal with respective annular surfaces of first and second hub members, the composite metal seal ring comprising an annular core of relatively hard metal, a first annular region of relatively soft metal integrally bonded to the annular core of relatively hard metal, and a second annular region of relatively soft metal integrally bonded to the annular core of relatively hard metal, the first annular region of relatively soft metal having a first annular surface for mating with the annular surface of the first hub member to effect a fluid pressure seal with the first hub member, and the second annular region of relatively soft metal having a second annular surface for mating with the annular surface of the second hub member to effect a fluid pressure seal with the second hub member, wherein the two annular regions of relatively soft metal are displaced from each other along a longitudinal axis of the composite metal seal ring, wherein the first annual region of relatively soft metal is welded onto the annular core of relatively hard metal, and the relatively soft metal of the second annular region of relatively soft metal is welded onto the annular core of relatively hard metal.

12. The composite metal seal ring as claimed in claim 11, wherein the first annular region of relatively soft metal has at least one annular groove in the neighborhood of the annular surface of the first annular region of relatively soft metal, and the second annular region of relatively soft metal has at least one annular groove in the neighborhood of the annular surface of the second annular region of relatively soft metal.

13. The composite metal seal ring as claimed in claim 11, wherein the composite metal seal ring has a longitudinal axis, and the annular surface of the first annular region of relatively soft metal is tapered with respect to the longitudinal axis to have a varying radius that is smallest away from the second annular region of relatively soft metal and that is largest toward the second annular region of relatively soft metal, and the annular surface of the second annular region of relatively soft metal is tapered with respect to the longitudinal axis to have a varying radius that is smallest away from the first annular region of relatively soft metal and that is largest toward the first annular region of relatively soft metal.

14. The composite metal seal ring as claimed in claim 13, wherein the first annular region of relatively soft metal has at least one annular groove in the neighborhood of the annular surface of the first annular region of relatively soft metal, the annular groove in the first annular region of relatively soft metal being rectangular in cross-section and having walls that are perpendicular to the tapered annular surface of the first annular region of relatively soft metal, and

wherein the second annular region of relatively soft metal has at least one annular groove in the neighborhood of the annular surface of the second annular region of relatively soft metal,

the annular groove in the second annular region of relatively soft metal being rectangular in cross-section and having walls that are perpendicular to the tapered annular surface of the second annular region of relatively soft metal.

21. A composite metal seal ring for effecting a resettable fluid pressure seal with respective annular surfaces of first and second hub members, the composite metal seal ring comprising an annular core of relatively hard metal, a first annular region of relatively soft metal integrally bonded to the annular core of relatively hard metal, and a second annular region of relatively soft metal integrally bonded to the annular core of relatively hard metal, the first annular region of relatively soft metal having a first annular surface for mating with the annular surface of the first hub member to effect a fluid pressure seal with the first hub member, and the second annular region of relatively soft metal having a second annular surface for mating with the annular surface of the second hub member to effect a fluid pressure seal with the second hub member, wherein the two annular regions of relatively soft metal are displaced from each other along a longitudinal axis of the composite metal seal ring;

wherein the first annular region of relatively soft metal has a thickness in said radial direction of at least one-eighth of an inch, and the second annular region of relatively soft metal has a thickness in said radial direction of at least one-eighth of an inch;

wherein the annular core of relatively hard metal is inlaid and overlaid with the relatively soft metal of the first annular region of relatively soft metal, and the annular core of relatively hard metal is inlaid and overlaid with the relatively soft metal of the second annular region of relatively soft metal;

wherein the first annular region of relatively soft metal is welded onto the annular core of relatively hard metal, and the relatively soft metal of the second annular region of relatively soft metal is welded onto the annular core of relatively hard metal;

wherein the composite metal seal ring has a longitudinal axis, and the annular surface of the first annular region of relatively soft metal is tapered with respect to the longitudinal axis to have a varying radius that is smallest away from the second annular region of relatively soft metal and that is largest toward the second annular region of relatively soft metal, and the annular surface of the second annular region of relatively soft metal is tapered with respect to the longitudinal axis to have a varying radius that is smallest away from the first annular region of relatively soft metal and that is largest toward the first annular region of relatively soft metal.

22. The composite metal seal ring as claimed in claim 21, wherein the first annular region of relatively soft metal has at least one annular groove in the neighborhood of the annular surface of the first annular region of relatively soft metal, the annular groove in the first annular region of relatively soft metal being rectangular in cross-section and having walls that are perpendicular to the tapered annular surface of the first annular region of relatively soft metal, and

wherein the second annular region of relatively soft metal has at least one annular groove in the neighborhood of the annular surface of the second annular region of relatively soft metal, the annular groove in the second annular region of relatively soft metal being rectangular in cross-section and having walls that are perpendicular to the tapered annular surface of the second annular region of relatively soft metal.

23. The composite metal seal ring as claimed in claim 21, wherein the composite metal seal ring is adapted for containing a pressure within the hubs of at least 10,000 psi.

24. The composite metal seal ring as claimed in claim 21, wherein the composite metal seal ring has an internal diameter of at least 3 inches.

25. The composite metal seal ring as claimed in claim 21, wherein the composite metal seal ring is a hybrid of a pressure energized seal type AX and a compression seal type BX.

26. A composite metal seal ring for effecting a resettable fluid pressure seal with respective annular surfaces of first and second hub members, the composite metal seal ring comprising an annular core of relatively hard metal, a first annular region of relatively soft metal integrally bonded to the annular core of relatively hard metal, and a second annular region of relatively soft metal integrally bonded to the annular core of relatively hard metal, the first annular region of relatively soft metal having a first annular surface for mating with the annular surface of the first hub member to effect a fluid pressure seal with the first hub member, and the second annular region of relatively soft metal having a second annular surface for mating with the annular surface of the second hub member to effect a fluid pressure seal with the second hub member, wherein the two annular regions of relatively soft metal are displaced from each other along a longitudinal axis of the composite metal seal ring;

wherein the first annular region of relatively soft metal has a thickness in said radial direction of at least one-eighth of an inch, and the second annular region of relatively soft metal has a thickness in said radial direction of at least one-eighth of an inch;

wherein the annular core of relatively hard metal is inlaid and overlaid with the relatively soft metal of the first annular region of relatively soft metal, and the annular core of relatively hard metal is inlaid and overlaid with the relatively soft metal of the second annular region of relatively soft metal;

wherein the first annular region of relatively soft metal is welded onto the annular core of relatively hard metal, and the relatively soft metal of the second annular region of relatively soft metal is welded onto the annular core of relatively hard metal;

wherein the composite metal seal ring has a longitudinal axis, and the annular surface of the first annular region of relatively soft metal is tapered with respect to the longitudinal axis to have a varying radius that is smallest away from the second annular region of relatively soft metal and that is largest toward the second annular region of relatively soft metal, and the annular surface of the second annular region of relatively soft metal is tapered with respect to the longitudinal axis to have a varying radius that is smallest away from the first annular region of relatively soft metal and that is largest toward the first annular region of relatively soft metal; and

wherein the composite metal seal ring is adapted for containing a pressure within the hubs of at least 10,000 psi, the composite metal seal ring has an internal diameter of at least 3 inches, and the composite metal seal ring is a hybrid of a pressure energized seal type AX and a compression seal type BX.